

ORIGINAL ARTICLE

Factors Affecting Oral Health-related Quality of Life Among the Homeless Population in Malaysia: a Structural Equation Modelling Analysis

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ABSTRACT

Introduction: Despite the increased number of homeless people in Malaysia, there is limited information on their oral health status and oral health-related quality of life (OHRQoL). This study aims to investigate the impact of caries experience, dental anxiety, oral health (OH) knowledge, and OH behaviours on the OHRQoL of homeless adults in Malaysia, as well as to determine the mediation role of caries experience towards OHRQoL. **Methods:** A cross-sectional study involving homeless persons was conducted in five states in Malaysia. Dental caries was examined using Decayed, Missing and Filled Teeth (DMFT) index. Face-to-face interview was conducted to collect information about OH knowledge and behaviours, dental anxiety, and OHRQoL using validated questionnaires. Meanwhile, descriptive and bivariate analyses were conducted using SPSS. Partial least squares structural equation modelling (PLS-SEM) was performed to test the hypotheses of the conceptual model with the support of SmartPLS. **Results:** A total of 192 homeless people completed the questionnaire and oral examination. The majority were male (84.9%), with a mean age of 43.72 (SD = 11.6). The severity of OHRQoL impact (mean OHIP score) was 18.61 (SD = 11.3). There were significant independent relationships between dental anxiety ($\beta = 0.306$, $p < 0.001$) and caries experience ($\beta = 0.280$, $p < 0.001$) on the homeless OHRQoL. It was found that the relationship between OH knowledge and OHRQoL was significantly mediated by caries experience. **Conclusion:** According to the structural model, caries experience, dental anxiety, and OH knowledge have significantly impacted the OHRQoL of the Malaysian homeless. These studied factors should be considered in the adoption of a holistic approach to improve the OHRQoL among homeless people in Malaysia.

Keywords: Oral health, Homeless, Oral health-related quality of life, Marginalised population

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INTRODUCTION

Homeless people are a section of a marginalised and vulnerable population that suffers from oral health inequalities, even in many developed countries (1). Their hidden and transient lifestyle, inability to meet basic daily needs, and poor psychosocial conditions lead to poor oral health service access (2,3). Studies showed that the homeless experienced a lower oral health-related quality of life (OHRQoL) compared with the general population (4–6). The OHRQoL is a multidimensional measure, and numerous studies have explored its relationship with clinical, individual, and environmental factors (7,8). However, in the homeless population, previous studies have solely focused on

the impact of clinical measures on OHRQoL (5,9–11), with caries experience being the most studied clinical oral condition. However, the relationship is still inconclusive because research findings have been inconsistent whereby a significant association was observed between the oral condition of the homeless population and their OHRQoL in Belfast (12), a weak relationship was reported among the homeless in the UK, Brazil, and Hong Kong (6,9,10), and no significant association between the two variables was found on the homeless population in Australia (5).

It was reported that there is a complex interplay between disease-related factors and individual factors that affect one's OHRQoL. Vigu et al. (13) showed a direct relationship between the impact of oral disease-related factor (caries experience) and individual factors (oral health attitudes and oral health behaviours) on OHRQoL. Nevertheless, the authors of the aforementioned work emphasised that the data should be considered

with caution, as OHRQoL is a multidimensional outcome measure. In addition, they highlighted the need to generate more evidence in this field to further understand the magnitude of the interaction between variables (13). Data from previous studies reported that homeless persons experienced high dental anxiety, low oral health (OH) knowledge, and poor OH behaviours (14, 15) when analysed under the individual factor. However, the impact of these factors on the OHRQoL of homeless people remains unexplored.

Several conceptual models of OHRQoL have been developed and revised over time. Based on previous findings on the relationship of oral disease and OHRQoL in the homeless population, this work adapted Wilson and Cleary model, as it is more comprehensive and includes clinical variables, functional status, psychological status, and overall quality of life (16). Furthermore, this study included Brunner and Marmot's (2006) model of health inequalities, as it theorises how environmental factors and individual factors might intervene in the relationship (17).

A conceptual model that includes the clinical (caries experience) and individual factors (dental anxiety, OH knowledge, and OH behaviours) was constructed for determining the OHRQoL (Fig. 1). A correlation analysis was conducted on the socio-demographic, medical background, and high-risk behaviour, with OHRQoL in the initial analysis to control the confounding factors. Factors with significant associations were included in the model. In this context, this study hypothesised that caries experience, dental anxiety, OH knowledge, and OH behaviour may impact the OHRQoL of the homeless. Moreover, the effects of individual factors may increase via clinical factor influence.

Studies on the homeless population and their oral health

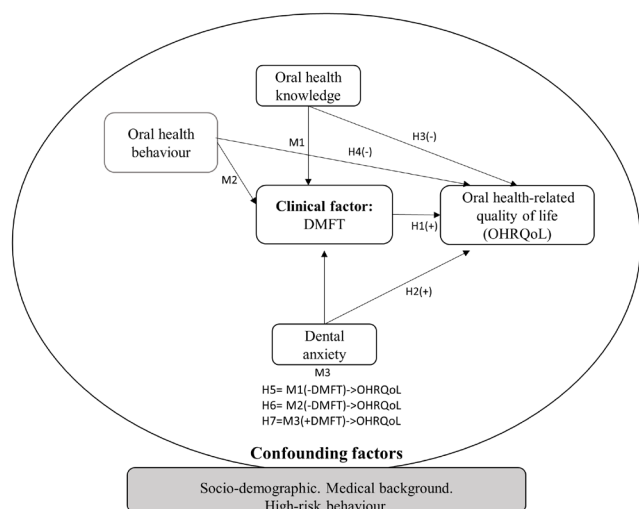


Figure 1: The conceptual model of study variables. Adapted from the revised Wilson and Cleary/Brunner Marmot model.

issues were mainly published by researchers in developed countries. To the best of the author's knowledge, minimal data are available on the OHRQoL of homeless adults in developing countries, including Malaysia. The existence of the homeless population has been on the rise with the development of this country. Kuala Lumpur City Council recently reported that there were at least 2,000 homeless people in the city (18). However, the precise number of homeless in the country remains unknown. Furthermore, there is a lack of oral health data of this marginalised population. Given the limited knowledge in this area, this study aims to investigate the impact of caries experience, dental anxiety, OH knowledge, OH behaviours on the OHRQoL of homeless adults in Malaysia, and to determine the mediation role of caries experience towards OHRQoL.

MATERIALS AND METHODS

Ethical consideration

Ethical approval to conduct this study was obtained from the Medical Ethics Committee, Faculty of Dentistry, University of Malaya [Ref: DF C01709/0069(P)]. Permission to conduct this study was obtained from the Malaysian Welfare Department.

Research design and study sample

This research was a cross-sectional study involving 205 homeless people selected through a non-probability convenience sampling method. Respondents were homeless adults (≥ 18 years old) from five cities, namely, Kuala Lumpur, Georgetown, Ipoh, Johor Bahru, and Kuching. In total, seven shelter homes were selected from the five states. The final respondents comprised of shelter residents and rough sleepers around the areas. Only Malaysian citizens who have experienced homelessness for at least 30 days, able to speak in Malay (national language) or English, and were not severely under drug or alcohol influences were included in the study.

Sample size calculation was based on Cohen's sample size recommendation in PLS-SEM (19). Based on the statistical power of 80% and statistical level at 5%, the sample size required to detect the effect was 137. As the homeless are a hard-to-reach population (20), a non-response rate of 50% was applied, which gives a minimum sample size requirement of 205. The number of respondents was proportionately calculated based on the estimated number of occupants and rough sleepers at each shelter centre. The respondents were selected from each centre until the minimum sample size was fulfilled.

Study instruments

Clinical oral examination

The clinical oral examinations were conducted by a trained and calibrated examiner using the World Health

Organization (WHO) diagnostic criteria (21). The Decayed, Missing, and Filled Teeth (DMFT) index was used for caries assessment (22), where only respondents who agreed to be assessed clinically were included. The oral examination was conducted at the shelter centres using a portable dental chair and torchlight. Before the fieldwork, the examiner was trained and calibrated with a gold standard who was a restorative specialist. The inter- and intra-examiner reliability scores were 0.95 and 0.98, respectively, indicating an almost perfect agreement (23).

Questionnaires

A set of questionnaires were adapted based on literature reviews to collect information on the socio-demographic characteristics, medical background, high-risk behaviours, OHRQoL, dental anxiety, OH knowledge, and OH behaviour.

The questionnaire items were assessed on their relevance and content-appropriateness by a dental public health academic, two specialists in special needs dentistry, two general dentists, and a social science researcher who has had experience dealing with homelessness. The item-content-validity index (I-CVI) obtained was 100% for each item.

A pre-test was conducted on 12 homeless persons residing in Kuala Lumpur, all of whom were not part of the primary study respondents. The purpose was to evaluate the clarity and appropriateness of the items and the language used, and to estimate the duration required to complete the questionnaire. The interview took approximately 20 to 40 minutes for each participant. Minor amendments were made to the questionnaire based on the feedback received.

The final questionnaire consists of seven parts. Part A consists of seven questions on socio-demographic characteristics, while Part B consists of 14 questions on medical history (i.e., past medical visits, use of prescribed medication, and medical conditions) and high-risk behaviours (i.e., drugs and alcohol abuse, smoking status, and habits of chewing tobacco, betel nut, and betel leaves).

Part C is a measurement of oral impact using the short version of the Malaysian Oral Health Impact Profile index [S-OHIP (M)] (24). The S-OHIP (M) contains 14 items that assess the impacts of oral conditions on OHRQoL. For each OHIP item, respondents were asked how frequently they had experienced the impact in the last six months. Responses were made on a scale of 0 (never) to 4 (very often), and the scores can range from 0 to 56. Higher OHIP scores indicate poorer OHRQoL. Part D consists of the Malay version of the Modified Dental Anxiety Scale (25) to determine the dental anxiety level. It is a unidimensional tool developed with five items, which assess common factors related to dental

fear specifically on their fear of the dentist, waiting for dental treatment, drilling procedure, scaling, and dental anaesthesia injection. Respondents rated their dental anxiety level on a five-point Likert scale, ranging from 1 (not anxious) to 5 (extremely anxious). Possible scores range from 5 to 25, with higher score indicating high anxiety.

Part E consists of five questions on OH behaviour and eight questions on OH knowledge, all of which were adopted from previous studies (26,27). For OH knowledge questions, each correct answer was assigned 1 point and incorrect answer was given a 0 score. The cumulative score of the eight items was used as the total score of OH knowledge construct, with higher score indicating better OH knowledge. A similar approach was used for OH behaviour questions (score 0 indicated poor OH behaviour, and score 1 indicated good OH behaviour). Higher total scores indicated a better behaviour related to oral health.

Data collection procedure

As homeless in Malaysia cities were invisible at daytime (28), the data collection was mainly conducted at nighttime between 7.00 p.m. to 12.00 a.m. A series of scheduled visits at the homeless shelters were done with the help of respective caretakers to gather the potential respondents. Five trained enumerators conducted the face-to-face interviews, and a single examiner conducted the clinical examination.

Before the data collection period, a letter was sent to each shelter centre to invite the residents to participate in this study. The participant information sheet was also provided which described the study's purposes including information about the interview and clinical examination sessions, and the confidentiality procedures. Rough sleepers were approached individually when they appeared during food distribution activity near the shelter centres. Written informed consent was obtained from each participant. After completing both the interview and clinical examination procedures, respondents were given a small token of appreciation.

Data analysis

The descriptive and bivariate analyses were performed using SPSS version 23. Partial least squares structural equation modelling (PLS-SEM) was performed using the SmartPLS version 3.2.2 software. Bivariate analysis was conducted using t-test and one-way ANOVA to determine whether any items in the socio-demographic characteristics, medical background, and high-risk behaviours were associated with OHRQoL. Only three items were found to be significantly associated with OHRQoL, namely, taking prescribed medication ($p = 0.02$), history of using a drug ($p < 0.001$), and current cigarette smoker ($p = 0.02$). The aforementioned three factors were included in the path modelling analysis in PLS-SEM.

For caries experience, the scores of decayed, missing, and filled teeth per individual were summed up, demonstrating the total DMFT scores. The higher the mean score of DMFT, the poorer the caries experience is.

The descriptive analysis of the dependent and independent variables was presented using the mean and median scores. The OHRQoL score was categorised into high and low impact based on the median value. Those with a score similar or higher than the median score were interpreted as experiencing a high oral impact (poor OHRQoL). In contrast, those who had OHRQoL scores lower than the median value were interpreted as experiencing a lower oral impact (better OHRQoL).

Measurement model assessment was done for construct validity of constructs followed by testing path model using bootstrap approach (with 5000 subsamples) to calculate the t value for all paths' statistical significance. The explanatory power of the model was assessed using R² for the dependent outcomes. The blindfolding procedure was used to test out-of-sample predictive power (Q²).

RESULTS

Socio-demographic characteristics, medical background, and high-risk behaviours

A total of 204 consented respondents were recruited. However, only 192 respondents completed both the questionnaire and clinical examination sections, giving a response rate of 93.7%. Incomplete data were excluded from the analysis. The majority of respondents were males (84.9%). In terms of ethnicity, a larger proportion of the respondents were Malay (67.2%), followed by the Indian (16.7%) and Chinese (11.5%). The respondents' mean age was 43.72 (SD = 11.36), ranging from 18–73 years old. Approximately 7% of the respondents had college or university qualifications, while 4.7% had no formal education. Rough sleepers formed 37.5% of this study population, while another 62.5% were sheltered homeless. Approximately 67% were reported to have been homeless for less than a year, whereas more than half of the homeless (56.3%) were jobless during the data collection period.

Overall, 68.8% respondents reported having at least one medical condition which include allergy (17.7%), asthma (16.7%), arthritis (16.7%), heart disease (8.9%), and diabetes (16.8%). About 45% had received medical treatment in the last six months and 48.4% were taking prescribed medication. In terms of high-risk behaviours, 77.6% were smokers, 52.1% had used drugs, 15.6% were currently under drugs abuse, and 16.1% were alcohol drinkers. A small proportion of respondents reported having tobacco (8.4.2%), betel nut (3.1%), and betel leaves (3.6%) chewing habits.

Descriptive analysis

Table I shows the descriptive analysis of the study variables. The mean values obtained for the independent variables were as follow: caries experience (9.39 ± 7.6), dental anxiety (9.68 ± 5.7), OH knowledge (6.11 ± SD = 1.6), and OH behaviour (2.54 ± 1.0). The overall mean score for OHRQoL was 18.61 ± 11.3, which was higher than the median score (17), indicating that most respondents in this study experienced higher impact level (i.e., poorer OHRQoL).

Table I: Descriptive analysis of study variables

	Mean (SD)	95% CI	Min-Max	Median (IQR)
Caries experience (n=184)	9.39 (7.6)	8.3-10.5	0-28	8.00 (12.0)
OHRQoL (n=192)	18.61 (11.3)	17.0-20.2	0-48	17.00 (16.0)
Dental anxiety (n=192)	9.68 (5.7)	8.9-10.5	5-25	7.00 (7.0)
OH knowledge (n=192)	6.11 (1.6)	5.9-6.3	1-8	6.00 (2.0)
OH behaviours (n=192)	2.54 (1.0)	2.4-2.7	0-5	3.00 (1.0)

OH=Oral health, OHRQoL=Oral health-related quality of life

Structural Equation Modelling

Assessment of measurement model (construct validity)

The reliability of the structural model is presented in Table II. High outer loadings on a construct specify that the relationship with the construct is strong, and this

Table II: Results reliability assessment of the measurement models

Latent Variables	Indicators	Loading	Cronbach α	CR	AVE				
Dental Anxiety	DA1	0.876	0.899	0.925	0.71				
	DA2	0.907							
	DA3	0.898							
	DA4	0.786							
	DA5	0.740							
	OHRQOL	QOL1				0.671	0.880	0.902	0.460
		QOL2				0.591			
		QOL3				0.773			
		QOL4				deleted			
		QOL5				deleted			
		QOL6				0.680			
		QOL7				0.605			
		QOL8				0.673			
		QOL9				0.723			
QOL10		0.773							
QOL11		0.586							
QOL12		0.632							
QOL13		deleted							
QOL14		0.703							
OH Knowledge*	OHK	1.000	1.000	1.000	1.000				
OH Behaviour*	OHB	1.000	1.000	1.000	1.000				
Caries experience	DMFT	1.000	1.000	1.000	1.000				

*Single item construct based on total score, OH= Oral health, OHRQoL=Oral health-related quality of life

characteristic is typically termed as indicator reliability. A general rule of thumb is that the (standardised) outer loadings must be 0.708 or higher (29). Indicators with very low outer loadings (below 0.40) were excluded from the scale. Table II shows all of the items' outer loadings for all variables in the initial and modified measurement models. Results showed that all outer loadings are within the acceptable range except for QOL4, QOL5, and QOL13. Cronbach's alpha value for all constructs was more than 0.6, and composite reliability for all constructs was greater than 0.80, exceeding the recommended value (29). The Heterotrait-Monotrait Ratio (HTMT) is a new technique to evaluate discriminant validity in variance-based SEM. It estimates the exact correlation between two constructs if they were correctly measured (i.e., if they are entirely reliable with no error). The HTMT value has to be less than 0.85 or 0.90 for the two constructs to be distinct (29). Table III reveals the HTMT values for all of the constructs in this research. In summary, the measurement model demonstrated adequate convergent validity and discriminant validity; therefore, the measurements are deemed reliable.

Evaluation of path (structural) model

The R² value of OHRQoL indicated that 23% of the variance in OHRQoL is predicted by dental anxiety, caries experience, OH knowledge, and OH behaviours. The model's predictive relevance was 0.09, which exceeded the recommended threshold value ($Q^2 > 0$), indicating medium predictive relevance (29) for the QoL construct. Figure 2 summarises the structural model results, including path coefficients (β) and confounders' role. Table IV refers to the inference on the effects size (f^2) estimate for the four independent latent variables. All variables were shown to have a small effect size on the OHRQoL.

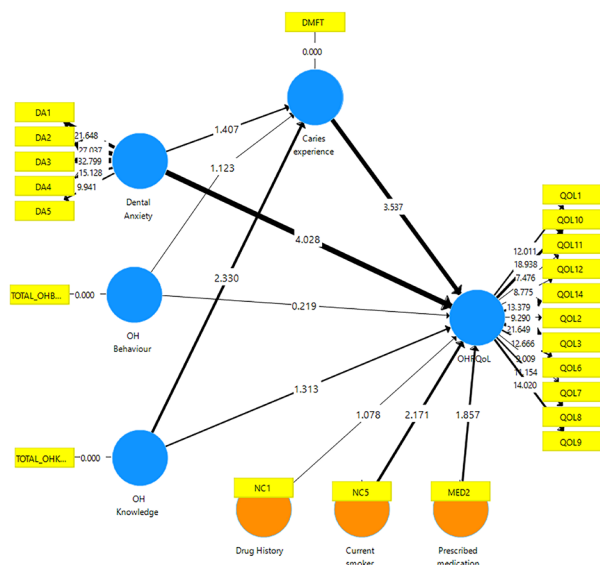


Figure 1: Structural model results. Numbers on the arrow (β), the path coefficients; numbers inside the circle (R^2), the explained variance; the thickness of the arrow indicates the path coefficients weight to rank their relative statistical importance. OH= Oral health, OHRQoL=Oral health-related quality of life.

Table IV: Test of mediation-distinguishing total, direct and indirect effects

Path	Total Effects	Direct Effects	Indirect Effects	Results
Dental anxiety -> Caries experience -> OHRQoL	0.279**	0.306**	-0.027	No mediation
Oral Health Knowledge -> Caries experience -> OHRQoL	0.128*	0.084	0.044*	Partial mediation
Oral Health Behaviour -> Caries experience -> OHRQoL	-0.007	0.015	-0.021	No mediation

**p-value <0.001, *p-value<0.05, OHRQoL=Oral health-related quality of life

Hypotheses testing

Results of the hypothesis testing show that three paths had significant relationships (Table IV). Dental anxiety and caries experience were found to directly correlate with OHRQoL impairment at $p < 0.001$, while OH knowledge demonstrated a significant relationship with OHRQoL through the mediation effects of caries experience (Fig. 2).

Mediation test

Mediation analysis was done based on the recommendation by Niltz et al. (30). Test of indirect effects on bootstrapping procedure showed that caries experience significantly mediated the relationship between OH knowledge and OHRQoL ($\beta = 0.04$, $p = 0.034$). Caries experience demonstrated partial mediation effects between OH knowledge and OHRQoL (Table V).

DISCUSSION

In the present study, the structural equation model was used to examine the complex interrelationship among individual factors, clinical factor, and OHRQoL. This is the first study that specifically examined the relationship between clinical factor (caries experience) and three individual factors: dental anxiety, OH health knowledge, OH behaviour, and their impact on the OHRQoL in the homeless population. Previous homeless studies on homeless population have solely focused at the relationship between their clinical condition and OHRQoL (10, 11). Comparisons with other studies' findings are not directly possible because published data on comprehensive OHRQoL models using PLS-SEM for homeless adults is almost non-existent. This comprehensive multivariate statistical method allows testing of all the relationships between latent and manifest variables in a model simultaneously, containing measurement structural model assessment (31).

This study found that caries experience score had an inverse relationship with OHRQoL. This finding is supported by other studies conducted among homeless population, which reported that high caries experience was associated with poor OHRQoL (6,9,12). When the descriptive data were compared with a national

Table V: Path coefficient and significance of the research hypotheses

Path	Path Coefficient (β)	t-value	sig	f ²	95% Confidence Intervals	Inference
Path a						
Dental Anxiety ->Caries experience	-0.096	1.407	0.080	0.009	[-0.207;0.014]	Not supported
OH Knowledge-> Caries experience	0.158	2.330	0.010	0.025	[0.046;0.269]	Not supported
OH Behaviours -> Caries experience	-0.076	1.123	0.131	0.006	[-0.185;0.036]	Not supported
Path b						
Caries experience ->OHRQoL	0.280	3.537	P<0.001	0.097	[0.144;0.408]	Supported
Path c'						
Dental Anxiety->OHRQoL	0.306	4.028	P<0.001	0.117	[0.194;0.442]	Supported
Dental Knowledge ->OHRQoL	0.084	1.313	0.095	0.008	[-0.094;0.128]	Not supported
OH Behaviours-> OHRQoL	0.015	0.219	0.413	0.000	[-0.02;0.182]	Not supported

OH = Oral Health, OHRQoL = Oral Health-Related Quality of Life

R² (DMFT=0.039, OHRQoL=0.233)Q² (DMFT=0.02, OHRQoL=0.10)Effects size impact indicator are according to Cohen (1988), f² values :0.35(large),0.15(medium), and 0.02(small)

T-value significant value according to Hair (2011) t>1.96

survey, the homeless population in the present study had lower caries experience (mean DMFT = 9.36) than the Malaysian general adults' population (mean DMFT = 11.66) (32). Nevertheless, the mean OHIP obtained in this study was three times higher compared to the national data (32). The state of being homeless itself might exacerbated the tense and suffering even for a simple oral health problem, which explains the higher oral impact scores in this population (12). The results are supported by the existing evidence that the disadvantaged and vulnerable population consistently perceived having low OHRQoL (33,34). In contrast, evidence from an Australian study reported no significant association between caries experience and OHRQoL amongst homeless persons (5). The contradicting findings could be because the Australian study samples were selected from sheltered homeless residents who received long-term accommodation and support service. In contrast, this study involved both sheltered and street homeless, which may perceive the impact on their quality of life differently.

In addition, findings indicated that dental anxiety was also inferred as the significant predictor for the OHRQoL among the studied population. Indeed, dental anxiety has been reported to be higher among the homeless population than the general population, as reported in similar studies done in Scotland and Australia (11,14). Predominantly, mental health issues and homeless are inseparable. A systematic review reported how housing disadvantaged are related to depression, psychological impairment, anxiety, allostatic load, mental strain, and psychological health (35). The evidence linking dental anxiety and OHRQoL amongst the homeless population is minimal, but this relationship has been documented in settled populations (36, 37). Further research is needed to explore the severity and implications of dental anxiety among the Malaysian homeless.

This study established a partial mediation effect in the pathway between OH knowledge, caries experience,

and OHRQoL. A partial mediation means that the effect of the OH knowledge on OHRQoL is significant through the caries experience path (30). This pathway analysis suggested that respondents with high OH knowledge score tend to have higher caries experience and poorer OHRQoL. This finding rejects the study's hypothesis that higher OH knowledge led to better oral condition and OHRQoL. A majority of this study participants have received a formal education, and potentially the high OH knowledge score may be gained during their previous school period, mass media, or oral health campaign at the shelter homeless centres. Nevertheless, they still experienced significant caries and poorer OHRQoL. This indicates that having high OH knowledge does not necessarily translate into good OH behaviour (38, 39), which consequently leads to poor oral condition and oral impact.

Results show there was no significant association between OH behaviour and OHRQoL in the PLS-SEM analysis. This finding was in contrast with other studies conducted among general populations in Korea and Romania (13, 40). As the data collection was conducted using face-to-face interviews, there was a probability of self-reporting and social desirability bias. Respondents tended to report positive OH behaviour or answered the questions in a manner that will be viewed as favourable by the interviewers. This situation might shadow the reality in this marginalised group and provide under-reporting data of the actual negative OH behaviours.

The path modelling analysis also shows the role of cigarette smoking and taking prescribed medication as confounding factors to poor OHRQoL. Existing evidence showed that low OHRQoL was often associated with smokers and people suffering from different types of diseases (41, 42). The results of the present study further support multifaceted factors that explained the OHRQoL of the homeless population. A qualitative study related to medical issues among the Malaysian homeless suggested that more attention should be given

to homeless health as the current initiative is insufficient in controlling their medical condition (43). Therefore, there is a need for a collaborative effort between various stakeholders such as the Malaysian Welfare Department, non-governmental organisations, Ministry of Health, and public hospitals in formulating holistic health and dental care approaches for the Malaysian homeless. Despite the advancement in the field of dentistry, the marginalised population is still left behind (44). Thus, there is a need to address the need of this population to reduce the gap of oral health inequality. The findings will be useful in providing baseline data to assist Oral Health Programme, Ministry of Health Malaysia to plan appropriate oral health services to cater to this population.

The findings from this study should be interpreted with some limitations. Firstly, the study used convenience and purposive sampling techniques, hence the findings may not be generalised to all Malaysian homeless. Secondly, common limitation of using the questionnaire technique such as recall bias, self-reporting, and social desirability bias may exist in this study. Effort has been made to minimise bias by ensuring the data of participants remain anonymous and by appointing experienced interviewers who are familiar with homeless group for better engagement to attain more accurate information.

CONCLUSION

This study found that there were significant association between clinical factors (dental caries) and individual factors (dental anxiety and OH knowledge) with homeless OHRQoL. The Malaysian homeless population perceived significant oral health impact concerning their caries experience, dental anxiety, and oral health knowledge. It is time to initiate an integrated, outreach, and holistic oral health program for improving the oral health of this marginalised population.

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